

GENERAL DESCRIPTION

The SGM11102S is a 1-bit control single-pole/double-throw (SPDT) switch, which supports from 0.1GHz to 5.8GHz. The device features low control voltage and high isolation.

The SGM11102S has the ability to integrate the ESD protection circuits to achieve high ESD tolerance.

No external DC blocking capacitors are required on the RF paths as long as no external DC voltage is applied, which can save PCB area and cost.

The SGM11102S is available in a Green ULGA-1×1-6L package.

APPLICATIONS

- Multi-Mode 2G/3G/4G/5G and Receive System Applications
- Pre PA Switching, Reception Bands Switching Applications
- General Purpose Switching Applications
- Feedback RX Applications

FEATURES

- **High Isolation:**
 - $f_0 = 1.0\text{GHz}, P_{IN} = 0\text{dBm}: 60\text{dB (TYP)}$
 - $f_0 = 2.0\text{GHz}, P_{IN} = 0\text{dBm}: 57\text{dB (TYP)}$
 - $f_0 = 2.7\text{GHz}, P_{IN} = 0\text{dBm}: 55\text{dB (TYP)}$
 - $f_0 = 3.8\text{GHz}, P_{IN} = 0\text{dBm}: 43\text{dB (TYP)}$
 - $f_0 = 5.8\text{GHz}, P_{IN} = 0\text{dBm}: 32\text{dB (TYP)}$
- **Low Insertion Loss:**
 - $f_0 = 1.0\text{GHz}, P_{IN} = 0\text{dBm}: 0.53\text{dB (TYP)}$
 - $f_0 = 2.0\text{GHz}, P_{IN} = 0\text{dBm}: 0.55\text{dB (TYP)}$
 - $f_0 = 2.7\text{GHz}, P_{IN} = 0\text{dBm}: 0.60\text{dB (TYP)}$
 - $f_0 = 3.8\text{GHz}, P_{IN} = 0\text{dBm}: 0.73\text{dB (TYP)}$
 - $f_0 = 5.8\text{GHz}, P_{IN} = 0\text{dBm}: 1.02\text{dB (TYP)}$
- Available in a Green ULGA-1×1-6L Package

BLOCK DIAGRAM

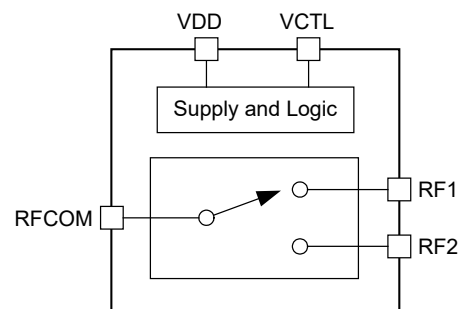


Figure 1. SGM11102S Block Diagram

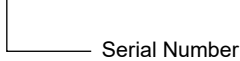
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM11102S	ULGA-1×1-6L	-40°C to +85°C	SGM11102SYULI6G/TR	ZU	Tape and Reel, 5000

MARKING INFORMATION

NOTE: Fixed character for ZU.

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Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

- Supply Voltage, V_{DD} 3.6V
- Control Voltage, V_{CTL} 3.6V
- RF Input Power, P_{IN} (f₀ = 2.7GHz) 27dBm
- Junction Temperature +150°C
- Storage Temperature Range -55°C to +150°C
- Lead Temperature (Soldering, 10s) +260°C
- ESD Susceptibility
- HBM 1000V

RECOMMENDED OPERATING CONDITIONS

- Operating Temperature Range -40°C to +85°C
- Operating Frequency Range, f₀ 0.1GHz to 5.8GHz
- Supply Voltage, V_{DD} 2.5V to 3.3V
- Control High Voltage, V_{CTL_H} 1.35V to 3.3V
- Control Low Voltage, V_{CTL_L} 0V to 0.3V

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

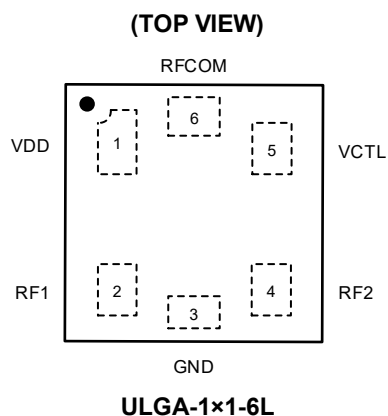
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATION



PIN DESCRIPTION

PIN	NAME	FUNCTION
1	VDD	DC Power Supply. Please connect a bypass capacitor with GND terminal for excellent RF performance.
2	RF1	RF I/O Port 1.
3	GND	Ground Terminal. Please connect this terminal with ground plane as close as possible for excellent RF performance.
4	RF2	RF I/O Port 2.
5	VCTL	DC Control Voltage. Please connect a bypass capacitor with GND terminal for excellent RF performance.
6	RFCOM	RF Common Port.

LOGIC TRUTH TABLE

VCTL	ACTIVE PATH
High	RFCOM to RF1
Low	RFCOM to RF2

ELECTRICAL CHARACTERISTICS

(T_A = +25°C, V_{DD} = 2.5V to 3.3V, typical values are at V_{DD} = 2.8V, P_{IN} = 0dBm, input and output resistance = 50Ω, V_{CTL_L} = 0V, V_{CTL_H} = 1.8V, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
DC Characteristics						
Supply Voltage	V _{DD}		2.5	2.8	3.3	V
Supply Current	I _{VDD}			20	40	μA
Control Voltage	V _{CTL_L}		0	0	0.3	V
Control Voltage	V _{CTL_H}		1.35	1.8	3.3	V
Control Current	I _{CTL}	V _{CTL_H} = 1.8V		1	2	μA
Switching Time	t _{SW}	50% V _{CTL} to 10/90% RF		1	2	μs
RF Characteristics						
Insertion Loss	IL	f ₀ = 1.0GHz, P _{IN} = 0dBm		0.53	0.79	dB
		f ₀ = 2.0GHz, P _{IN} = 0dBm		0.55	0.82	
		f ₀ = 2.7GHz, P _{IN} = 0dBm		0.60	0.86	
		f ₀ = 3.8GHz, P _{IN} = 0dBm		0.73	1.15	
		f ₀ = 5.8GHz, P _{IN} = 0dBm		1.02	1.45	
Isolation (RFCOM to All RF Ports)	ISO	f ₀ = 1.0GHz, P _{IN} = 0dBm	46	60		dB
		f ₀ = 2.0GHz, P _{IN} = 0dBm	42	57		
		f ₀ = 2.7GHz, P _{IN} = 0dBm	38	55		
		f ₀ = 3.8GHz, P _{IN} = 0dBm	34	43		
		f ₀ = 5.8GHz, P _{IN} = 0dBm	24	32		
Input Power at 0.1dB Compression Point	P _{0.1dB}	f ₀ = 0.1GHz to 3.0GHz		27		dBm
		f ₀ = 3.0GHz to 5.8GHz		25		
Voltage Standing Wave Ratio	VSWR	f ₀ = 0.1GHz to 3.0GHz		1.25		
		f ₀ = 3.0GHz to 5.8GHz		1.52		

TYPICAL APPLICATION CIRCUIT

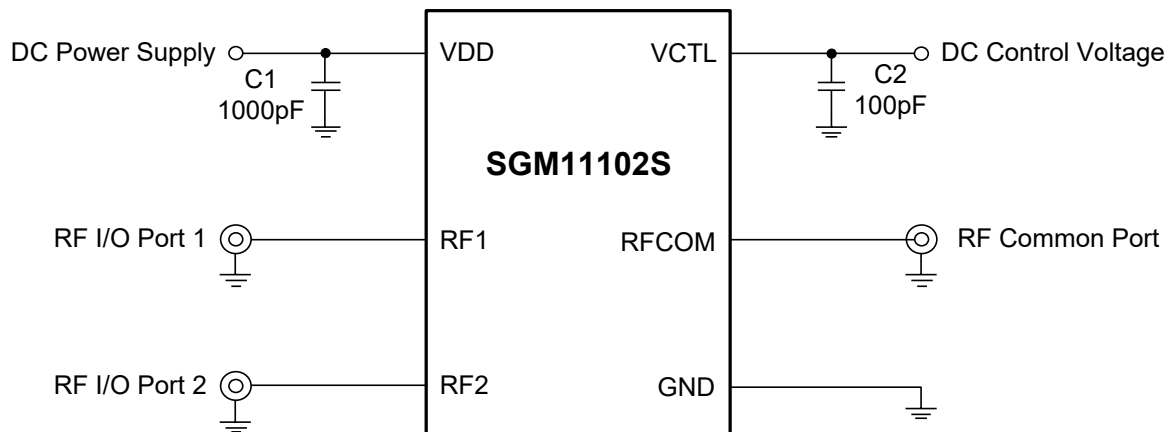


Figure 2. SGM11102S Typical Application Circuit

EVALUATION BOARD LAYOUT

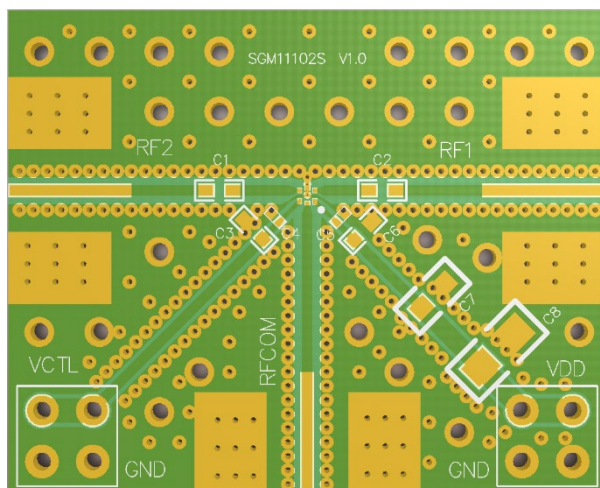
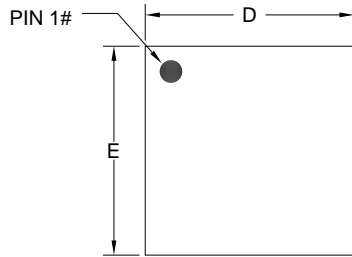


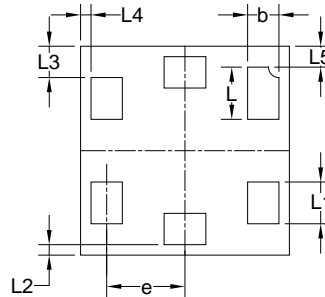
Figure 3. SGM11102S Evaluation Board Layout

PACKAGE OUTLINE DIMENSIONS

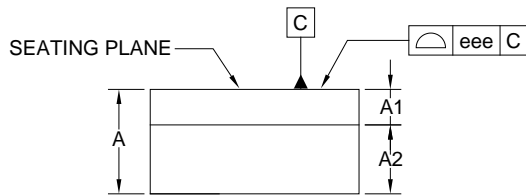
ULGA-1x1-6L



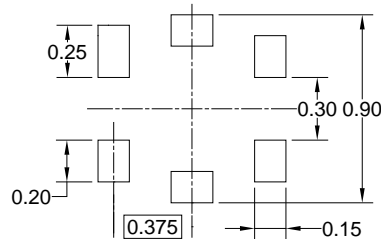
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

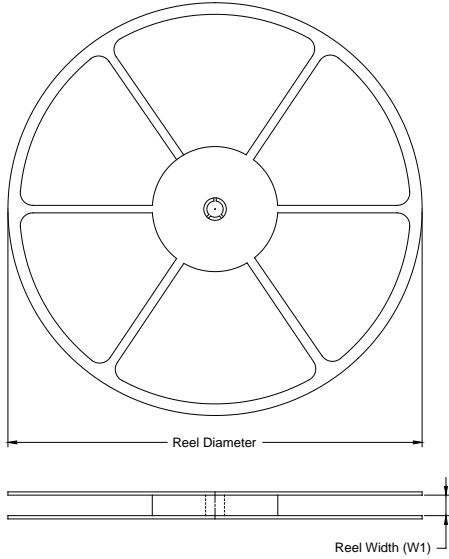
Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	0.450	0.500	0.550
A1	0.140	0.170	0.200
A2	0.290	0.330	0.370
b	0.100	0.150	0.200
D	0.950	1.000	1.050
E	0.950	1.000	1.050
e	0.375 BSC		
L	0.200	0.250	0.300
L1	0.150	0.200	0.250
L2	0.000	0.050	0.100
L3	0.150 REF		
L4	0.000	0.050	0.100
L5	0.100 REF		
eee	0.100		

NOTE: This drawing is subject to change without notice.

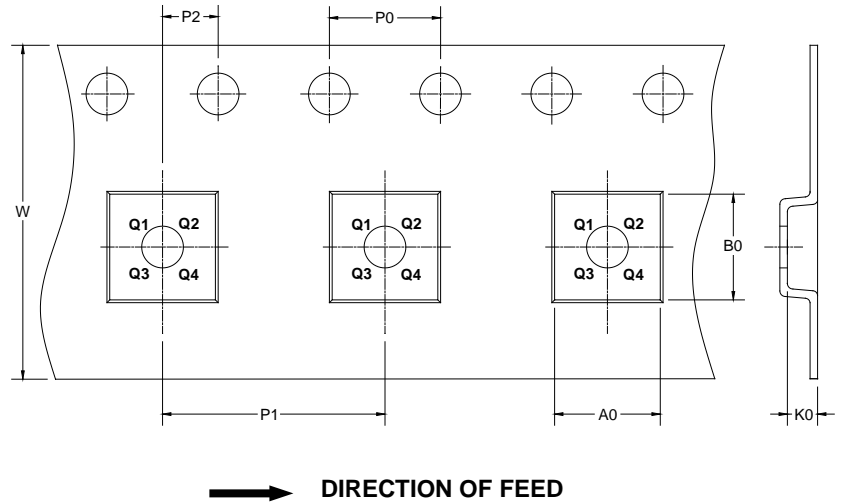
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

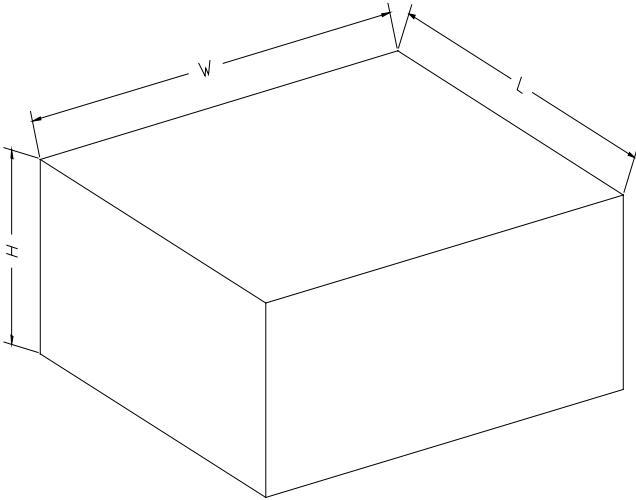
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
ULGA-1x1-6L	7"	9.5	1.13	1.13	0.72	4.0	4.0	2.0	8.0	Q2

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PACKAGE INFORMATION

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7" (Option)	368	227	224	8
7"	442	410	224	18

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